



# Nanoquest II

*Ion Beam Etching System*



## Features

- Single wafer load-locked Ion Beam Etching System for up to 150mm wafers
- RF ICP Gridded Ion Source provides user selectable beam potential and current density
- Substrate stage provides active water cooling with simultaneous rotation and tilt during ion beam operation
- Low-profile clean room interface keeps instrument cabinet and etch module behind the clean room wall

# nanoquest ion

## ION BEAM ETCHING SYSTEM

Designed for clean room operation, the Nanoquest II keeps the etch module in the service area of the clean room. System components, such as shields and other serviceable items, are easily accessed in the service area. A double door etch module allows servicing from either side of the chamber. UHV design rules ensure that the etch module and load lock chamber achieve very low base pressures. High speed vacuum pumps not only provide a fast pump down, but also reduce ion beam gas collisions.

INTLVAC's Nanoquest II Ion Beam Etching System combines a water-cooled, rotating stage, a 16cm RF ion source, an easily accessible stainless steel vacuum chamber, cryogenic high vacuum pumping system, automatic pump down and venting, atmosphere to high vacuum gauging, mass flow controllers, chamber cabinet, and electronic control console.



## HIGH PERFORMANCE

The Nanoquest comes supplied with 150mm and 100mm wafer platens for batch loading configuration with carbon masks for smaller sized wafers. With uniformity of  $\pm 3\%$  over a 100mm diameter, and a repeatability of  $\pm 2\%$  wafer to wafer, the Nanoquest is the ideal platform for your process.

## SYSTEM CONFIGURATION AND LAYOUT

The vacuum chamber is constructed using only stainless steel and UHV compatible fabricating techniques with an electro-polished outer surface for a clean and attractive appearance. Continuous stainless steel cooling channels are welded in a web-like pattern on the outside of the chamber to provide an efficient heat sink.

The vacuum chamber has hinged front and rear doors for easy access and multiple view-ports for complete process observation, including one view-port for the optional load lock. The Nanoquest system achieves  $5 \times 10^{-7}$  Torr in 2 hours and  $5 \times 10^{-8}$  Torr in 24 hours using a combination of dry vacuum pumps. The Nanoquest may be configured with either Cryopump or Maglev Turbo pump.



# beam etching

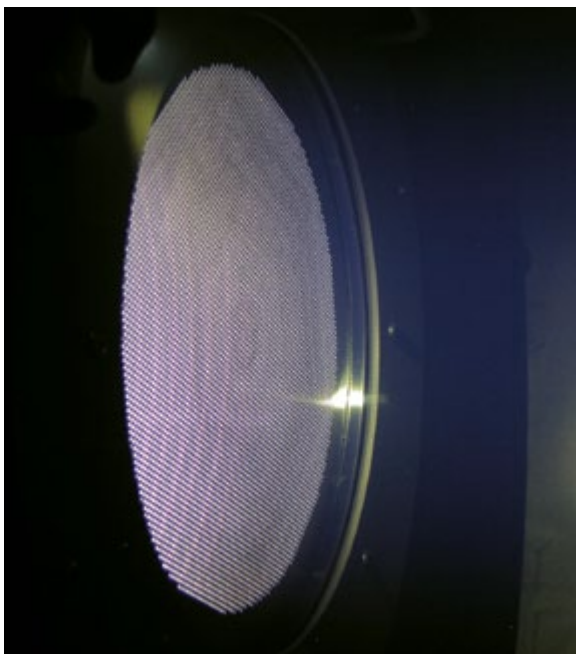
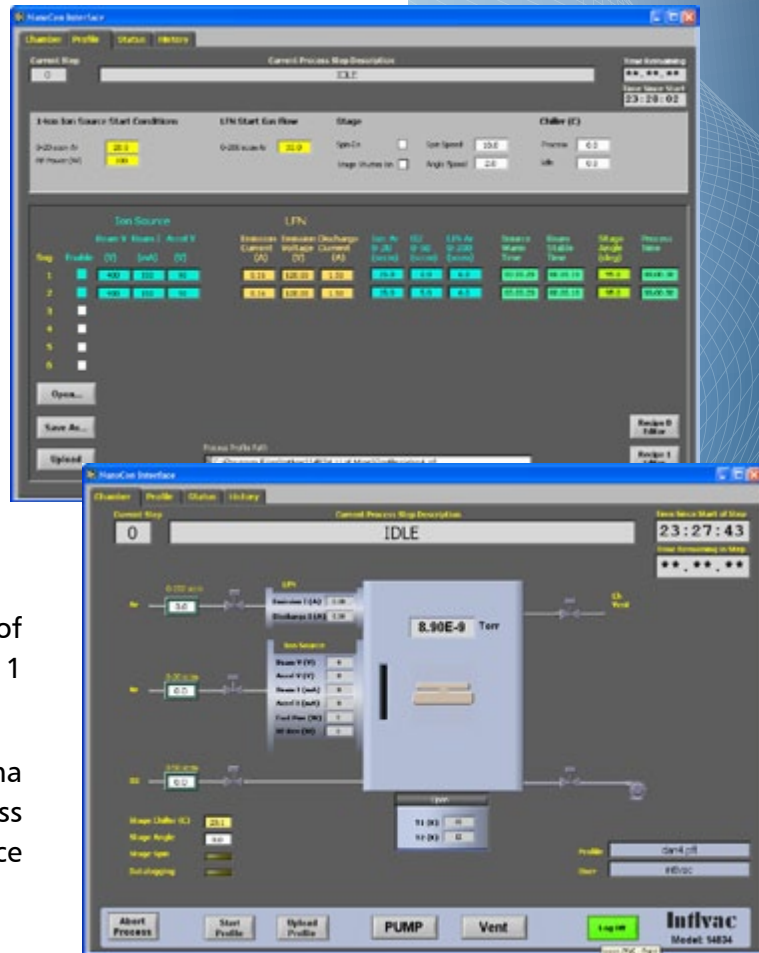
## SYSTEM CONTROL AND MONITORING

The LabVIEW based automated computer control system features total system management in an easy to use Windows-based package. The LabVIEW Controller allows for automatic sequencing of electro-pneumatic actuators to pump the chamber down from atmosphere to high vacuum pressure. Venting of the system to atmosphere is achieved automatically with INTLVAC's AutoVac Controller.

## THE RF ICP ION SOURCE

The 16cm ion beam source operates over a range of 100 to 1500eV, achieving ion beam currents over 1 Amp. Features of the 16cm ion source include:

- Plasma Discharge Chamber: High density plasma generated through RF ICP technology with filamentless ionization enabling long operation before maintenance



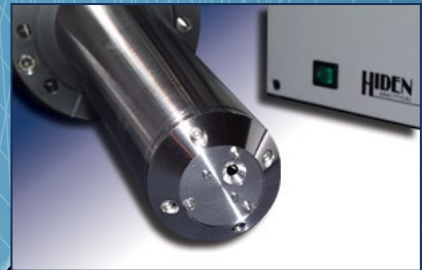
- Ion Optics: Self-aligning technology ensures repeatable process runs and longer grid lifetime and Molybdenum construction makes them robust and maintenance friendly
- Modular Design: Ion source is completely accessible from the chamber for easy serviceability. Internal mounts allow the throw distance to be optimized for etch rates and uniformity.
- Power Supply: Frequency matched RF power supply provides rapid response to changing conditions and provides improved contamination resistance.



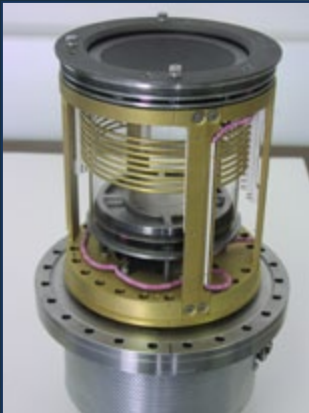
Load-lock can fit 4" to 6" substrates



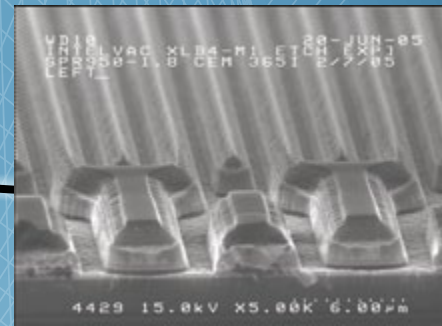
Retractable SIMS End-point Detector



Up to 22cm D.C. or R.F. Ion Source



SiO<sub>2</sub> passivation by R.F. Sputtering



Direct water-cooled Stage with integral beam probe



4cm R.F. Ion Source for IBS with Target Indexer



D.C., A.C., or R.F. Magnetron Sputtering

